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EXAMINER	
DATSKOVSKIY, SERGEY	
ART UNIT	**PAPER NUMBER**
2121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/085,665	RYU ET AL.	
	Examiner	Art Unit	
	Sergey Datskovskiy	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the claims

Claims 1-20 were originally presented. After the First Non-final Office Action, claims 1-3 and 10-12 were amended. Claims 1-20 are still pending in the Instant Application.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1, 2, 10 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, specification does not support the newly added limitation: "*different command of the user is generated based on a number of times the user's mouth is shut within an interval of time*". Specification contains activating different commands when a mouth is shut once or twice in a sequence. However, it does not explicitly mention counting the number of times a mouth is shut within an interval of time. The most relevant part of the specification is in the paragraph [0042], where it describes determining that the mouth is shut sequentially by checking the time interval between two wave-packets. There is no indication of said mouth shutting sequence to happen *within* any particular time interval.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 5-11 and 14-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Junker (US Patent No. 5,474,082) in view of Ward et al. (US Patent No. 4,408,192).

Claim 1

Junker teaches an apparatus for controlling an electrical device (col. 3, lines 24-29) using a bio-signal extracted from the movement of a user's face (col. 3, lines 37-44), comprising:

a bio-signal detection means (Fig. 1, electrodes 22; col. 6, lines 15-17) for detecting the bio-signals generated when the user shuts his/her mouth and when the user moves his/her head left and right (col. 3, lines 40-44, where detecting signals from head rotation and shutting mouth is inherently disclosed by measuring biopotentials from muscle groups of neck and jaw); and

a means for controlling the electrical device for analyzing the bio-signal detected in the bio-signal detection means to control the electrical device according to the command of the user (Fig. 1, background loop processor 35; col. 7, lines 13-18).

Junker does not expressly teach that a different command of the user is generated based on a number of times the user's mouth is shut within an interval of time.

However, Ward teaches generating different commands based on the number of times the user moves a muscle within an interval of time (col. 4, lines 20-24; col. 2, lines 7-9; user gives different commands by generating certain numbers of sequential muscle signals forming a code, such as for example the Morse code (col. 2, lines 22-24)).

Junker and Ward are analogous art since they are both related to the area of non-manual human control of an electrical device. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the control system able to detect bio-signals generated by the user, such as shutting his/her mouth from Junker (col. 3, lines 40-44) and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward. The reason for doing so would be to provide user with an ability to issue more sophisticated commands by using a code that allows communication, such as Morse code (Ward, col. 2, lines 22-24). Therefore, it would have been obvious to modify Junker in view of Ward by counting the number of sequential shutting mouth commands to form a code.

Claim 2

Junker teaches an apparatus for controlling an electrical device (col. 3, lines 24-29) using a bio-signal extracted from the movement of a user's face (col. 3, lines 37-44), comprising:

a bio-signal detection unit (Fig. 1, electrodes 22; col. 6, lines 15-17) for detecting the bio-signal when the user shuts his/her mouth and when the user moves his/her head left and right (col. 3, lines 40-44, where detecting signals from head rotation and shutting mouth is inherently disclosed by measuring biopotentials from muscle groups of neck and jaw);

a bio-signal amplification unit for amplifying the amount of the bio-signal detected in the bio-signal detection unit (Fig. 1, amplifier filter 24; col. 6, lines 51-52);

an A/D converter for converting the amplified bio-signal into the bio-signal of a digital mode (Fig. 1, A/D converter 26; col. 6, lines 59-61);

a control unit for analyzing the bio-signal of the digital mode to determine a corresponding command of the user and then generating a determined command of the user (Fig. 1, background loop processor 35; col. 7, lines 13-18); and

a transmission unit for transmitting the determined command to the electrical device via infrared signal (col. 6, lines 61-65).

Junker does not expressly teach that a different command of the user is generated based on a number of times the user's mouth is shut within an interval of time.

However, Ward teaches generating different commands based on the number of times the user moves a muscle within an interval of time (col. 4, lines 20-24; col. 2, lines 7-9; user gives different commands by generating certain numbers of sequential muscle signals forming a code, such as for example the Morse code (col. 2, lines 22-24)).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the control system able to detect bio-signals generated by the user, such as shutting his/her mouth from Junker (col. 3, lines 40-44) and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward using the same motivation as in claim 1 above.

Claim 5

Junker teaches the apparatus as claimed in claim 2, wherein the bio-signal detection unit has a predetermined number of electrodes attached to the user's body portion (col. 6, lines 28-30).

Claim 6

Junker teaches the apparatus as claimed in claim 5, wherein the body portion is the forehead of the user (col. 6, lines 26-28).

Claim 7

Junker teaches the apparatus as claimed in claim 5, wherein the number of the electrode is two (col. 6, lines 26-30. The phrase "has" in "has a predetermined number" in the parent claim is interpreted as "comprise". Such interpretation is given in view of the disclosure stating that the system can also have three electrodes (paragraph [0024]). Therefore, Junker discloses having two electrodes, *i.e.* signal line electrodes).

Claim 8

Junker in view of Ward teaches the apparatus as claimed in claim 7.

Junker does not expressly disclose that the two electrodes are positioned under "International 10-20 System of Electrode Placement".

However, Examiner takes Official Notice that the 10-20 system is well known as an internationally established standard for placing electrodes on a human skull.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the International 10-20 System of Electrode Placement for positioning the two electrodes since Examiner takes Official Notice that such system is well known as an internationally established standard for placing electrodes on a human skull.

Claim 9

Junker teaches the apparatus as claimed in claim 8, wherein the two electrodes are positioned at Fp1 and Fp2 locations of the forehead of the user (the two electrodes

are disclosed to be positioned on the forehead of a user (the two electrodes are disclosed to be placed on the forehead (see col. 6, lines 26-28). In view of using the International 10-20 System of Electrode Placement, such forehead positions correspond to Fp1 and Fp2 locations).

Claim 10

Junker teaches a method for controlling an electrical device (col. 3, lines 24-29) using a bio-signal extracted from the movement of a user's face (col. 3, lines 37-44), comprising the steps of:

detecting the bio signals generated when the user shuts his/her mouth and when the user moves his/her head left and right (col. 3, lines 40-44, where detecting signals from head rotation and shutting mouth is inherently disclosed by measuring biopotentials from muscle groups of neck and jaw); and

analyzing the bio-signal detected in the bio-signal detection means to control the electrical device according to the command of the user (Fig. 1, background loop processor 35; col. 7, lines 13-18).

Junker does not expressly teach that a different command of the user is generated based on a number of times the user's mouth is shut within an interval of time.

However, Ward teaches generating different commands based on the number of times the user moves a muscle within an interval of time (col. 4, lines 20-24; col. 2, lines

7-9; user gives different commands by generating certain numbers of sequential muscle signals forming a code, such as for example the Morse code (col. 2, lines 22-24)).

Junker and Ward are analogous art since they are both related to the area of non-manual human control of an electrical device. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the control system able to detect bio-signals generated by the user, such as shutting his/her mouth from Junker (col. 3, lines 40-44) and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward. The reason for doing so would be to provide user with an ability to issue more sophisticated commands by using a code that allows communication, such as Morse code (Ward, col. 2, lines 22-24). Therefore, it would have been obvious to modify Junker in view of Ward by counting the number of sequential shutting mouth commands to form a code.

Claim 11

Junker teaches a method of controlling an electrical device (col. 3, lines 24-29) using a bio-signal extracted from the movement of a user's face (col. 3, lines 37-44), comprising the steps of:

detecting the bio-signal when the user shuts his/her mouth and when the user moves his/her head left and right (col. 3, lines 40-44, where detecting signals from head rotation and shutting mouth is inherently disclosed by measuring biopotentials from muscle groups of neck and jaw);

amplifying the amount of the detected bio-signal (Fig. 1, amplifier filter 24; col. 6, lines 51-52) and then converting the amplified bio-signal into the bio-signal of a digital mode (Fig. 1, A/D converter 26; col. 6, lines 59-61);

analyzing the converted bio-signal to determine a corresponding command of the user and then generating the determined command (Fig. 1, background loop processor 35; col. 7, lines 13-18); and

transmitting the generated command to the electrical device via infrared rays (col. 6, lines 61-65).

Junker does not expressly teach that a different command of the user is generated based on a number of times the user's mouth is shut within an interval of time.

However, Ward teaches generating different commands based on the number of times the user moves a muscle within an interval of time (col. 4, lines 20-24; col. 2, lines 7-9; user gives different commands by generating certain numbers of sequential muscle signals forming a code, such as for example the Morse code (col. 2, lines 22-24)).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the control system able to detect bio-signals generated by the user, such as shutting his/her mouth from Junker (col. 3, lines 40-44) and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward using the same motivation as in claim 11 above.

Claim 14

Junker teaches the method as claimed in claim 11, wherein the step of analyzing further includes an initialization step of obtaining a time period and an average increase/decrease amount of the signal suitable for the user since the moving speed and angle of the head are different depending on users (disclosed as setting gain values and computing time averaged magnitude and phase values, see col. 11, lines 42-49).

Claim 15

Junker teaches the method as claimed in claim 11, wherein the step of analyzing further includes an initialization step of setting the reference value and the length of the signal suitable for the user since the time and strength of the users who shut his/her mouth are different (disclosed by adjusting responsiveness, see col. 10, lines 59-65).

Claim 16

Junker teaches the method as claimed in claim 11, wherein the bio-signal is extracted from a predetermined number of electrodes attached to the user's body portion (col. 6, lines 28-30).

Claim 17

Junker teaches the method as claimed in claim 16, wherein the body portion is the forehead of the user (col. 6, lines 26-28).

Claim 18

Junker teaches the method as claimed in claim 16, wherein the number of the electrode is two (col. 6, lines 26-30. The phrase "has" in "has a predetermined number" in the parent claim is interpreted as "comprise". Such interpretation is given in view of the disclosure stating that the system can also have three electrodes (paragraph [0024]). Therefore, Junker discloses having two electrodes, *i.e.* signal line electrodes).

Claim 19

Junker in view of Ward teaches the method as claimed in claim 18.

Junker does not expressly disclose that the two electrodes are positioned under "International 10-20 System of Electrode Placement".

However, Examiner takes Official Notice that the 10-20 system is well known as an internationally established standard for placing electrodes on a human skull.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the International 10-20 System of Electrode Placement for positioning the two electrodes since Examiner takes Official Notice that such system is well known as an internationally established standard for placing electrodes on a human skull.

Claim 20

Junker teaches the method as claimed in claim 19, wherein the two electrodes are positioned at Fp1 and Fp2 locations of the forehead of the user (the two electrodes are disclosed to be placed on the forehead (see col. 6, lines 26-28). In view of using the International 10-20 System of Electrode Placement, such forehead positions correspond to Fp1 and Fp2 locations).

3. Claims 3, 4, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Junker (US Patent No. 5,474,082) in view of Ward et al. (US Patent No. 4,408,192), and further in view of Black et al. (US Patent No. 5,774,591).

Claim 3

Junker in view of Ward teaches the apparatus as claimed in claim 2, which can interpret bio-signals for turning ON and OFF (col. 8, lines 52-53) and directional commands for selecting command items (disclosed as a cursor control program, see col. 15, lines 15-18).

Junker does not expressly teach that if the user shuts his/her mouth twice, the control mode of the electrical device is switched from an inactive (OFF) mode to an active (ON) mode or from the active mode (ON) to the inactive mode (OFF), if the user moves his/her head left (right), left (right) movement is made between command items

of the electrical device, and if the user shuts his/her mouth once, the predetermined command item is selected.

However Black teaches using mouth opening to invoke commands such as, for example, turning a device on or off (col. 27, lines 51-52), and using head rotation for movement between command items on the electrical device (col. 27, lines 18-23).

Junker, Ward and Black are analogous art because they are all directed to the area of non-manual human control of an electrical device. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the bio-signal controllable system of Junker and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward and the facial signals from Black. The reason for doing so would be to provide user with an ability to issue more sophisticated commands by using a code that allows communication, such as Morse code (Ward, col. 2, lines 22-24), and to provide a selection control that enables user to use his attention for selecting command items by rotating his head (Black, col. 27, lines 24-27), and use shutting mouth as an example of a simple human facial gesture (Black, col. 27, lines 50-52). Therefore, it would have been obvious to modify Junker in view of Ward, and further in view of Black by combining the bio-signal controllable system with encoded commands and the facial signals generated by rotating the head and shutting the mouth.

Claim 4

Junker in view of Ward teaches the apparatus as claimed in claim 2, which can interpret bio-signals as directional commands for selecting command items (disclosed as a cursor control program, see col. 15, lines 15-18).

Junker does not expressly teach that the left (right) movement between the command items of the electrical device is performed only when the user moves his/her head from the center to the left (right) side.

However Black teaches the left (right) movement between the command items of the electrical device is performed only when the user moves his/her head from the center (centering head is disclosed as being in initially neutral position, see col. 25, lines 47-49) to the left (right) side (col. 27, lines 61-63).

Therefore, it would have been obvious to modify Junker in view of Ward, and further in view of Black by combining the bio-signal controllable system with the facial signals generated by rotating the head using the same motivation as in claim 3 above.

Claim 12

Junker in view of Ward teaches the method as claimed in claim 11, which can interpret bio-signals for turning ON and OFF (col. 8, lines 52-53) and directional commands for selecting command items (disclosed as a cursor control program, see col. 15, lines 15-18).

Junker does not expressly teach that if the user shuts his/her mouth twice, the control mode of the electrical device is switched from an inactive (OFF) mode to an

active (ON) mode or from the active mode (ON) to the inactive mode (OFF), if the user moves his/her head left (right), left (right) movement is made between command items of the electrical device, and if the user shuts his/her mouth once, the predetermined command item is selected.

However Black teaches using mouth opening to invoke commands such as, for example, turning a device on or off (col. 27, lines 51-52), and using head rotation for movement between command items on the electrical device (col. 27, lines 18-23).

Junker, Ward and Black are analogous art because they are all directed to the area of non-manual human control of an electrical device. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the bio-signal controllable system of Junker and combine it with counting the sequential muscle signals (especially, signals of the jaw muscles) to encode different commands (col. 4, lines 20-24; col. 2, lines 7-9) from Ward and the facial signals from Black. The reason for doing so would be to provide user with an ability to issue more sophisticated commands by using a code that allows communication, such as Morse code (Ward, col. 2, lines 22-24), and to provide a selection control that enables user to use his attention for selecting command items by rotating his head (Black, col. 27, lines 24-27), and use shutting mouth as an example of a simple human facial gesture (Black, col. 27, lines 50-52). Therefore, it would have been obvious to modify Junker in view of Ward, and further in view of Black by combining the bio-signal controllable system with encoded commands and the facial signals generated by rotating the head and shutting the mouth.

Claim 13

Junker in view of Ward teaches the method as claimed in claim 12, which can interpret bio-signals as directional commands for selecting command items (disclosed as a cursor control program, see col. 15, lines 15-18).

Junker does not expressly teach that the left (right) movement between the command items of the electrical device is performed only when the user moves his/her head from the center to the left (right) side.

However Black teaches the left (right) movement between the command items of the electrical device is performed only when the user moves his/her head from the center (centering head is disclosed as being in initially neutral position, see col. 25, lines 47-49) to the left (right) side (col. 27, lines 61-63).

Therefore, it would have been obvious to modify Junker in view of Ward, and further in view of Black by combining the bio-signal controllable system with the facial signals generated by rotating the head using the same motivation as in claim 12 above.

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Junker and Black are non-analogous art. However, Junker and Black both belong to the art of non-manual human control of an electrical device.

Specifically, a wheelchair from Black is an instance of an electrical device. Therefore, both inventions belong to the same art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sergey Datskovskiy whose telephone number is (571) 272-8188. The examiner can normally be reached on Monday-Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight, can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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